INSIGHT, COPING STRATEGIES AND DEFICIT SYNDROME IN CHRONIC SCHIZOPHRENIA

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Abbreviation

AC: anterior cingulated basal ganglia-thalamocortical circuit
BCIS: Beck Cognitive Insight Scale
BIS: Birchwood Insight Scale
BPRS: Brief Psychiatric Rating Scale
CGI: Clinical Global Impressions
DLPFC: dorsolateral prefrontal basal ganglia-thalamocortical circuit
DSM-IV-TR: Diagnostic and Statistical Manual of Mental Disorder; Fourth Edition; Text Revision
ITAQ: Insight and Treatment Attitudes Questionnaire
PANSS: Positive and Negative Syndrome Scale
SAI: Schedule for Assessment of Insight
SAIQ: Self-Appraisal of Illness Questionnaire
SANS: Scale for Assessing Negative Symptoms
SAPS: Scale for Assessing Positive Symptoms
SCID: Structured Clinical Interview for DSM-IV-TR
SDS: Schedule for the Deficit Syndrome
SPSS: Statistical Package for Social Science
SUMD: Scale to Assess Unawareness of Mental Disorder
SUMDA: Scale to Assess Unawareness of Mental Disorder (Abridged)
WCQ: Ways of Coping Questionnaire
WCST: Wisconsin Card Sort Test

Summary

Lack of insight is an important symptom in schizophrenia. It has been reported that diminished insight appears characteristic of schizophrenic patients with the deficit syndrome (Carpenter et al 2001). Lack of insight may result form deficits in cognitive functions and/or avoidant coping strategies (Lysaker et al 2001).

In this cross-sectional, case-control study, we interviewed 103 Chinese patients aged between 18 and 55 with chronic schizophrenia in Singapore, divided them into deficit and nondeficit groups by using the Schedule for the Deficit Syndrome (SDS, Kirkpatrick et al., 1989), and assessed their symptoms, coping strategies and insight by the positive and Negative Syndrome Scale (PANSS) (Key et al., 1987), Ways of Coping Questionnaire (WCQ) (Folkman and Lazarus, 1988) and the Scale to Assess Unawareness of Mental Disorder (Abridged) (SUMDA) (Amador et al., 1994).

We found that deficit syndrome was related to negative coping strategies and poor insight, supporting the view that deficit syndrome is a separate disease within schizophrenia. We also replicated the five-factor model of PANSS and found the strong relationship between insight and seeking social support.

The results of this study have the potential to develop psychotherapy skills to enhance treatment adherence of the patients.

Chapter 1 Literature Review

1.1 The definition and measurement of insight

1.1.1 Insight is a multidimensional phenomenon

Lack of insight is an important symptom in schizophrenia. The World Health Organization's international pilot study of schizophrenia reported that, among a sample of 811 operationally defined acute schizophrenics, 97% were without insight (Carpenter et al, 1973). Patients with schizophrenia had poorer insight than patients with schizoaffective disorder and patients with psychotic unipolar depression but did not differ from patients with bipolar disorder (Pini et al., 2001).

However, the earliest researchers used vague definitions of insight such as "a correct attitude to morbid change in oneself" (Lewis, 1934) or "verbal recognition by the patient of existing psychological difficulties" (Eskey, 1958, p. 428). Patients were then categorized as having full insight, partial insight or no insight or simply rated by one or several item of general scale (for example, G12 of the PANSS or three items of AMDP Cuesta and Peralta, 1994). Patients were asked questions regarding insight but the reasons behind their responses were not explored. This method was criticized for the lack of validity and the difficulty in measuring finer gradations of insight.

The lack of a consistent definition of insight in relation to psychopathology poses an important problem in its measurement (Markova and Berrios, 1995). In more recent investigations, there has been a gradual movement towards the conceptualization of

insight in terms of more than one dimension and its measurement along a continuum. For example: many researchers (Greenfeld et al, 1989; David 1990; Amador et al. 1991) have argued that insight comprises a variety of phenomena, including retrospective and current insight. As we shall discuss in great detail, Amador et al (1991) have stressed the distinction between awareness and attribution of psychotic symptoms, as some patients may recognize signs of illness but attribute their presence to reasons other than mental dysfunction. Furthermore, some patients may recognize certain symptom while remaining unaware of others. In a recent article, Beck et al (2003) proposed that patients with psychoses may be impaired in their ability to examine and question beliefs and interpret experiences, and defined these skills as cognitive insight. At the most fundamental level, then, poor insight in psychosis has been described as a seeming lack of awareness of the deficits, consequences of the disorder, and need for treatment.

There are two main kinds of scales for measuring insight: 1) a semi-structured interview schedule; 2) a self-reported scale.

1.1.2 Insight scales by semi-structured interview

The Insight and Treatment Attitudes Questionnaire (ITAQ) is developed to measure two dimensions of insight, the patient's failure to acknowledge illness and need for treatment (McEvoy et al., 1989). The ITAQ consists of a semi-structured interview of 11 items. Each item is scored from 0 (no insight) to 2 (good insight) and the total score is used as an insight measure. This questionnaire encompasses recognition of mental disorder (first five items) and attitudes to medication, hospitalization and follow-up evaluation (six items). The main criticism of this approach was that it failed to account for patients'

perception of specific symptoms of the disorder, such as cognitive processes, emotions and behavior (Markova and Berrios, 1992).

David (1990) has argued on both theoretical and empirical grounds that the concept is composed of three different but overlapping constructs. These are: the ability to relabel unusual mental events (e.g. hallucination) as pathological; recognition by the patient that he or she is suffering from an illness and that the illness is mental; and treatment compliance, both expressed and observed. The contention is that relationship of insight to psychopathology is not a direct, linear one and, furthermore, the elements which make up insight, as it is commonly conceived, may also be partially independent. According this theory, he developed a scale named Schedule for Assessment of Insight (SAI). It is a semi-structured interview containing 7 items each rated from 0 to 2 and a supplementary question rated from 0 to 4. It is used to rate all three components of insight.

In addition, the Scale to Assess Unawareness of Mental Disorder was developed to assess current and retrospective awareness of having a mental disorder, the effects of medication, the consequences of mental illness, and the awareness and attributions for the specific signs and symptoms of the disorder (SUMD; Amador et al., 1993). The SUMD is a 20-item semi-structured interview which evaluates global insight, insight into illness and insight into symptoms. It comprises three ratings each for global insight into current and past illness: general awareness of having a mental disorder, need for psychiatric treatment, and social consequences of the disorder. Moreover, by averaging responses referring to 17 psychopathological signs and symptoms, which were scored on a 5-point scale four additional scales were obtained patients' current and past awareness, and current and past attributional patterns. In recent years, this scale has increased in

popularity and has been used frequently to assess insight in schizophrenia and its relationship to psychopathology (Amador and Gorman, 1998).

1.1.3 Insight scales by self-report

The method using scales based on interview does not easily lend itself to frequent repeated measurement and requires inter-rater reliability to be established. As supplement, self-report scales are needed. The Birchwood Insight Scale (BIS, Birchwood et al., 1994), the Self-Appraisal of Illness Questionnaire (SAIQ) and the Beck Cognitive Insight Scale (BCIS) are three examples of self-report scale.

The Birchwood Insight Scale (BIS) is a self-report eight-item scale. Each item is a statement to which the subjects can answer, "agree", "unsure" or "disagree" (scored on a three-point Likert-type scale ranging from 0 to 2). The measure includes three subscales labeled awareness (i.e. awareness of mental illness), relabel (i.e. attribution of one's symptoms as part of one's disorder) and need for treatment. The first two subscales include two items and the third has four items. Items within the subscales are summed giving a total score for each subscale. The sum of the items included in the Need for Treatment subscale (which has twice as many items) is divided by two. The total score for the IS ranges from 0 to 12 and is obtained by summing the total scores of the three subscales. Higher scores indicate greater insight.

The Self-Appraisal of Illness Questionnaire (SAIQ) is a pencil and paper self-report instrument composed of 17 items. The format for each item is a statement or a question. The items address acknowledgment of illness, beliefs about the outcome of illness, acknowledgment of a need for psychiatric treatment, and extent of worry about illness

and about illness-related issues. Participants are asked to respond to the statements and questions using a four-point Likert scale, which varies according to the statement or question content (Marks et al., 2000).

The Beck Cognitive Insight Scale (BCIS) is a 15-item self-report measure designed to assess cognitive insight in patients with psychoses. Participants rate the extent to which they agree with statements on a scale from 0 (do not agree at all) to 3 (agree completely). The BCIS is comprises two subscales, self-reflectiveness (nine items) and self-certainty (six items). A composite Reflectiveness–Certainty Index (or R-C Index) score is obtained by subtracting the total score of the self-certainty subscale from the total score of the self-reflectiveness subscale and is considered a measure of cognitive insight. Higher R-C Index scores indicate greater cognitive insight.

1.2 Insight and symptoms in schizophrenia

1.2.1 The symptom groups in schizophrenia

It is unclear whether schizophrenia can be validly divided into categorical subtypes. In the past two decades, the wide application of scales and computers has promoted a resurgence of interest in identifying nature groupings of schizophrenia symptoms.

Crow(1980) proposed two syndromes in schizophrenia: the type I syndrome consisted of positive symptoms, such as hallucinations and delusions, occurring in the acute illness, which were responsive to treatment with antipsychotic drugs, and were not associated with intellectual impairment. He postulated a neurochemical pathological process involving dopamine transmission. The type II syndrome comprised negative symptoms,

principally affective flattening, poverty of speech, and loss of drive. These symptoms tended to be irreversible and were associated with poor outcome, failure to drug treatment, intellectual impairment, and an underlying structural pathology. To identify both syndromes, SANS, SAPS (Andreasen, 1982 & 1983) and PANSS (Kay et al, 1987) were developed as powerful instruments.

The Scale for Assessing Negative Symptoms (SANS), as the first method devised specifically to measure negative phenomena in schizophrenia, has gained ascendance in the United States. Its main asset is a detailed and internally reliable inspection of five negative symptoms: affective flattening, alogia, avolition-apathy, anhedonia-asociality, and attentional impairment. When used with the four-item companion Scale for Assessing Positive Symptoms (SAPS), a comparison with positive symptoms is made possible, although this is to some extent mitigated by imbalance in the number of items in the SANS vs. SAPS (Kay, 1991).

The Positive and Negative Syndrome Scale (PANSS) was later developed in an attempt to provide a more comprehensive assessment of the symptoms of schizophrenia (Key et al., 1987). The scale comprises 30 items, and was designed to assess three main domains: the positive subscale (7 items), the negative subscale (7 items) and the general psychopathology subscale (14 items). The scale includes all of the items from the Brief Psychiatric Rating Scale (BPRS) (Overall and Gorham, 1988) and select items from the Psychopathology Rating Scale (Singh and Kay, 1987). The PANSS is widely used in clinical and research settings, and is regarded as a reliable means of symptom assessment.

A great deal of study based on factor analyses of different scales has been planned to support the positive/negative dichotomy. However, factor analyses suggest that schizophrenia's symptom tend to aggregate into three primary factors. Liddle (1987) conducted factor analyses of symptom scores in a group of 40 chronic schizophrenic patients and concluded that their symptoms segregate into three syndromes, with a disorganization factor besides a positive and negative symptom factor. The disorganization factor includes symptoms such as distractibility, poverty of content of speech, tangentiality, and inappropriate affect, which had been allocated previously into either the positive or negative group by different authors (Liddle, 1987). These results have been replicated in subsequent studies (Mortimer et al, 1990; Lenzenweger et al, 1991; Peralta et al, 1992; Palacios-Araus et al, 1995; Arora et al, 1997).

However, more subsequent study revealed that the three-dimension model was oversimplified. Vazquez-Barquero et al (1996) proposed that positive symptom should be divided into two dimensions: paranoid and non-paranoid. Meanwhile, Millers et al (1996) hypothesized that hallucinations and delusions were the third and the fourth factor. Lenzenweger and Dworkin (1996) presumed that premorbid social adjustment deficits was the fourth subgroup, and Gardo et al (1996) insisted that positive symptom was consisted of paranoid symptoms, first rank delusions and first rank hallucinations. This view was partly supported by the research of Lin et al (1998) who assumed that 'loss of ego boundary' delusions and experience of auditory hallucinations appeared as two sub-clusters in the group of delusions and hallucinations. Salokangas et al (1997) adopted a five-dimension model which contained negative, disorganized, delusional, hallucinatory and depressive symptom. In the five-factor model of Emsley et al (2003), the dimensions

were negative, positive, disorganized, excited and anxiety/depression. Different models obviously correlated with different scales used in factor analyses. Peralta and Cuesta (2001) compared the results of analyzing SAPS/SANS with those analyzing PANSS and BPRS and summarized that three-factor model was easy to obtained in the former while in the latter a five-factor solution best represents the whole scale's items. They suggested that there existed eight major dimensions of psychopathology in schizophrenia and by extension in the psychoses: psychosis, disorganization, negative, mania, depression, excitement, catatonia and lack of insight.

1.2.2 Insight and symptom groups

Several studies have examined the relationship between insight and symptoms of schizophrenia. However, these studies yielded conflicting results. For example, no significant relationships have been found between insight and acute psychopathology (McEvoy et al., 1989). However, other researchers have found a significant relationship between insight and severity of *some* symptoms, such as delusions, thought disorder and disorganized behavior (Amador et al., 1994). The few studies that have investigated the relationship between insight and negative symptoms of schizophrenia have also yielded conflicting results. For example, Amador et al. (1994) found no significant correlation between any SUMD score and negative symptoms although increased social isolation was modestly correlated with less awareness of mental disorder, the social consequences of mental disorder and the efficacy of medication. However, Smith et al. (2000) found a small relationship between awareness of current symptoms and negative symptoms.

The contradiction between different studies can be interrupted from several aspects. Firstly, the concepts of both insight and symptoms continuously grew and multi-dimensional structures are developed so that the methods used to assess insight and symptoms were various. They weakened the continuity among different studies when different researchers adopted different scales. Secondly, there are two approaches to investigate if lack of insight is an enduring trait or a correlate of illness severity. One approach to this issue has been to examine the cross-sectional relationship between insight and symptom severity (David et al., 1992; Cuesta and Peralta, 1994; Amador et al., 1993, 1994). Another approach has been to examine insight longitudinally (Carroll et al., 1999; Chen et al., 2001). It might be another source of inconsistency. Thirdly, most of studies recruited subjects from groups of chronic schizophrenic patients. Their results could not represent those patients in acute episode.

Mint et al. (2003) reviewed 40 published English-language studies and found that there was a small negative relationship between insight and global, positive and negative symptoms. There was also a small positive relationship between insight and depressive symptoms in schizophrenia.

At present, it remains uncertain if the relationship between insight and symptomatology is nonlinear and, therefore, a large multi-factorial study, which samples patients in varied stages of the disorder and considers clinical factors such as acute status and age of onset, is needed. This type of study should also examine how the specific dimensions of insight relate to other symptoms in schizophrenia.

1.2.3 Insight and deficit syndrome

It is important that, despite either none or modest correlation between insight and positive or negative symptoms, diminished insight appears characteristic of schizophrenic patients with the deficit syndrome. Carpenter and coworkers proposed that deficit psychopathology defined a group of patients with a disease different from schizophrenia in the absence of deficit features, as the deficit and non-deficit groups differ in their signs and symptoms, course, biological correlates, treatment response, and etiologic factors. In general, patients with deficit syndrome are associated with (1) greater social and physical anhedonia, (2) less depression on self-report and by clinicians' ratings, (3) less suicidal ideation, and (4) less severe delusions with an exclusively social content, such as delusions of jealousy. They present poorer function than those with non-deficit syndrome prior to the appearance of positive psychotic symptoms, for example, less likely to marry, poor social and occupational function. In neuropsychological and functional imaging study, deficit and non-deficit groups share AC (anterior cingulated basal ganglia-thalamocortical circuit) behavioral and functional abnormalities, but differ relative to DLPFC (dorsolateral prefrontal basal ganglia-thalamocortical circuit) involvement (Kirkpatrick et al., 2001). It implies that the association between poor insight and primary negative symptoms might be stronger than between insight and secondary negative.

1.3 Etiology of Poor Insight in Schizophrenia

To date, research on the etiology of poor insight in schizophrenia has tended to proceed from one of two theoretical approaches. First, a considerable body of literature has

emphasized how unawareness of illness may result from cognitive impairments. Various authors suggested that, paralleling observations about anosognosia (unawareness of deficits in neurological disorders), persons with schizophrenia may fail to recognize their illness because of generalized deficits in abstract and flexible thinking (e.g. Amador et al., 1991; Lysaker and Bell, 1994). Another perspective, however, suggests that poor insight is reflective of a coping style. Here it is argued that the perception that one is not ill may not reflect an absence of understanding, but result from a coping style wherein stressors are actively avoided or recast as positive events (Bassman, 2000; Frese, 1993). Some have further proposed unawareness of illness may even be an adaptive way of avoiding the social role of "schizophrenic" which has been documented as stigmatizing (Link, 1987). Evidence supporting this view includes research indicating that embracing beliefs about oneself as "mentally ill" are linked with a pattern of more recalcitrant psychosocial deficits. However, the DSM-IV-TR addresses the issue of insight in schizophrenia with the following statement: "A majority of individuals with schizophrenia have poor insight regarding the fact that they have a psychotic illness. Evidence suggests that poor insight is a manifestation of the illness itself rather than a coping strategy" (APA 2000, p304). Lysaker et al. (2002) compare these two models and find that insight and neurocognition are related to one another in a linear manner and that coping preference is independently related to insight as well. They imply that psychosocial and psycho-educational programs that seek to improve awareness need to address coping style as well as being sensitive to neurocognitive deficits.

1.3.1 Insight and cognitive function

Many researches investigated the relationship between insight and executive functions and obtained different results. While some studies (Collins et al., 1997; Mccabe et al., 2002) found no significant association between total insight and cognitive impairment, Smith et al. (2000) administered a battery including measures of visual processing, memory, visuo-spatial ability and executive functions and revealed that symptom misattribution more than symptom unawareness was associated with deficits in frontal lobe functioning. Rossell et al. (2003) discovered that poor WCST performance inversely correlated with insight in schizophrenia patients and confirmed that there is a relationship between insight and executive performance. Drake and Lewis (2003) reviewed 15 studies and concluded that, of the range of neurocognitive functions assessed in different studies, only the Wisconsin Card Sort Test (WCST) performance, particularly perseverative error score, appeared to show a replicated association with measures of insight. Seven of 15 studies find this association and 6 of 8 negative studies have potential design problems (for example: non-compliant patients, few positive symptoms, small sample or limited insight measures). Their study showed a correlation between insight and perseverative errors, rather than more general measures of abstraction. A factor representing relabelling symptoms, derived from insight scale items, correlated even more strongly; however, other insight factors correlated more weakly, suggesting they are less dependent on neuropsychological deficits.

Previous studies have attempted to link unawareness of illness to other cognitive processes. Given the prominence of attentional impairments in schizophrenia (Nuechterlein and Dawson, 1984, Spring et al., 1991, Cornblatt and Keilp, 1994 and

Nuechterlein et al., 1998) and links to frontal lobe dysfunctions (Buchsbaum et al., 1990, Cornblatt and Keilp, 1994 and Mesulam, 2000), it seems reasonable to believe that poor insight may be associated with attentional deficits. Three studies have found a relationship between measures of attention and poor insight (Lysaker and Bell, 1995, Voruganti et al., 1997 and Walker and Rossiter, 1989), and three have failed to detect this relationship (Dickerson et al., 1997, Kim et al., 2003 and Rossell et al., 2003).

Few studies have looked at the relationship between insight and neuroanatomical measures. Rossell et al. (2003) studied insight by MRI brain scan and found there were no significant correlations between whole brain, white and grey matter volume and degree of insight. The relation between insight and more special cortical regions is unknown.

1.3.2 Insight and coping strategy

Historically, self-awareness deficits in schizophrenia have typically been understood as stemming from psychological defenses or adaptive coping strategies. While psychoanalytic approaches emphasize the role of unconscious defense such as denial and sealing over in poor insight (Lynda et al. 2003), more cognitively oriented research emphasizes the importance of attribution in understanding poor insight (i.e. extreme self-serving cognitive bias, Taylor and Brown 1988).

However, according to their results, different coping strategies might play different roles on poor insight patients. For example, patients unaware of symptoms also had a greater preference for positive reappraisal than aware or partially unaware patients. Patients unaware of the consequences of disorder endorsed a greater preference for escape-

avoidance than the partially unaware participants (Lysaker et al 2002). With regard to the specific coping strategy associated with unawareness of illness, the data point to a passive dismissal rather than active avoidance of stressors or the recasting of stressors as positive events.

1.3.3 Relationship between cognitive functions and coping strategies

It is still controversial whether the aforementioned are two independent approaches. Coping can be defined as "the cognitive and behavioral efforts to manage specific external and/or internal demands appraised as taxing or exceeding the resources of the individual." It mainly depends on the personality and stress (Folkman and Lazarus, 1988). However, as more and more researches identified, coping strategy or personality can be related to special psychotic symptoms. It has been discovered that persons with schizophrenia tend to present with a different pattern of personality trait, endorsing higher levels of neuroticism and lower levels of extraversion, openness, agreeableness and conscientiousness than community controls (Lysaker and Davis, 2004). Similarly, Horan and Blanchard (2002) reported that schizophrenic patients demonstrated a pattern of high trait negative affectivity and low trait positive affectivity and a coping style characterized by more common use of maladaptive coping strategies. Bechdolf et al. (2002) compared the coping strategies to self-experienced prodromal symptoms between patients with schizophrenia and depression, and found that patients with schizophrenia showed significantly more often an increased emotional reactivity and certain perception and thought disturbances and depressive patients reported significantly more often an impaired tolerance to certain stress and disorders of emotion and affect. Moreover, there

is evidence that premorbid personality features correlated with the symptom profile. In a prospective follow-up cohort, positive symptoms associated with overactive, irritable, distractible and aggressive behavior at school (Cannon et al. 1990). In a cross-sectional study with recent onset patients, disorganized symptoms associated with antisocial behavior and negative symptoms have been associated with long-standing schizoid traits (Cuesta et al. 1999). Because of the lack of cohort studies, it is hard to say this relationship stemmed from whether psychotic symptoms affect personality, or some special personality traits are more vulnerable to some special symptoms.

Startup (1996) presented an intriguing issue in his article. He investigated 26 schizophrenic patients with neuropsychological tests and insight scale and found a quadratic dependence between insight and cognitive function, rather than a simple linear correlation. To interpret his observation, he supposed that patients with pronounced cognitive deficits may be incapable of recognizing the true extent of their illness, but equally, may be incapable of the kind of self-deception required by motivational theories. However, his conclusion may be questioned in terms of small sample and mixture of acute, chronic and rehabilitated patients.

Recently, Lysaker and colleges referred to this problem, and revealed that patients who were unaware of symptoms, treatment need and consequences generally performed more poorly than the aware groups on tests of executive function (2002). This result supported the viewpoint that insight and neurocognition are linearly related; while coping preference is independent with cognitive function. In another paper, they found that patients with poor insight and average executive function endorsed a significantly greater preference for denial as a coping strategy than the poor insight and poor executive

function group, while good insight group did not differ significantly from either poor insight group in coping strategy (2003).

1.4 Summary

Several issues concerning insight in schizophrenia still have not been adequately addressed by previous research in this area. For instance, the published literature indicates that patients with deficit syndrome have poorer insight than those with nondeficit syndrome and there are some qualitative differences of cognitive function between these two groups; however, there has not been any study to investigate whether there are differences of coping strategies between deficit and nondeficit patients, which might contribute to their different insight. In addition, although there are plenty of researches about the relationship between insight and symptoms, they seldom preferred to use the multidimensional model of schizophrenic symptoms basing on factor analysis.

There are at least three major reasons for this interest. First, if special coping strategies could be identified in deficit syndrome, this might testify that deficit syndrome is a separate disease within schizophrenia. Second, the discovery of the relationship between coping strategies and insight could help us understanding the mechanism of lack of insight. Third, studying coping strategies and insight can provide guidelines for psychotherapies.

The above highlights the need for further research. To this purpose, the present study set out to investigate in detail the differences of coping strategies between deficit and

nondeficit syndromes, and the relationships between insight, coping strategies and symptom groups based on factor analysis in a sample of chronic schizophrenic patients.

Chapter 2 Materials and Methods

2.1 Aims and hypothesis

The aims of this cross-sectional, case control study were to determine whether insight and coping strategies in deficit group differs from those in nondeficit group; and, in relation to each other. The null hypotheses were:

1) Patients in deficit group have no different insight from those in nondeficit group, and

2) Patients have no difference in coping strategies between deficit and nondeficit groups.

We also supposed that there are dimensional relationships among symptoms, insight and coping strategies.

2.2 Subjects

One hundred and three chronic schizophrenic patients were recruited from both the outpatient and inpatient units of National University Hospital. These subjects were studied between February 2003 and May 2006.

2.2.1 Inclusion Criteria

The inclusion criteria were as follows:

(1) DSM-IV schizophrenia (APA 1994) disorder with the consensus of two experienced psychiatrists,

(2) Both genders,

(3) Age between 18-55,

(4) Chinese speaking Chinese or English,

(5) Duration of illness more than 2 years.

2.2.2 Exclusion Criteria

(1) Patients with a primary diagnosis of mood disorder,

(2) Mental retardation,

(3) Patients with a history of organic brain disease, head injury, and/or significant drug or alcohol dependence,

(4) Patients who suffered from active psychotic symptoms so that could not finish WCQ.

2.3 Instrument

2.3.1 Insight

Insight was measured with the Scale to Assess Unawareness of Mental Disorder (Abridged) (SUMDA; Amador et al., 1994). SUMDA was a shortened version of the SUMD. This version was nearly identical to the SUMD with the exception that several symptom items, the retrospective awareness scales, and all of the attributional scales were omitted. Each item could be calculated separately: scores for each of the nine items ranged from 1 to 3: "1": aware, "2": somewhat aware/unaware, and "3": severely unaware.

2.3.2 Deficit Syndrome

The patients were categorized into deficit or non-deficit subgroups by using the Schedule for the Deficit Syndrome (SDS, Kirkpatrick et al., 1989), a semi-structured interview that defines the deficit syndrome as having at least two primary negative symptoms (including: restricted affect, diminished emotional range, poverty of speech, curbing of interests, diminished sense of purpose and diminished social drive) of at least moderate severity present for the preceding 12 months even during periods of clinical stability and in the absence of factors such as anxiety, drug effect, positive symptoms, mental retardation, and depression. Besides self-reporting, confirmed information was obtained from the referring clinicians and family members.

Criteria for deficit schizophrenia in SDS:

1. At least 2 of the following 6 features must be present and of clinically significant severity:

Restricted affect

Diminished emotional range

Poverty of speech

Curbing of interests

Diminished sense of purpose

Diminished social drive

2. Two or more of these features must have been present for the preceding 12 months, and always have been present during periods of clinical stability (including chronic psychotic states). These symptoms may or may not be detectable during transient episodes of acute psychotic disorganization or decompensation.

3. Two or more of these enduring features are also idiopathic, i.e., not secondary to factors other than the disease process. Such factors include:

Anxiety

Drug effect

Suspiciousness

Formal thought disorder

Hallucinations or delusions

Mental retardation

Depression

4. The patient meets DSM-IV criteria for schizophrenia.

2.3.3 Coping strategy

Ways of Coping Questionnaire (WCQ) (Folkman and Lazarus, 1988) assesses thoughts and actions individuals use to cope with the stressful encounters of everyday living. It is a self-report instrument that asks participants to call to mind a recent stressor and then rate how often they have used 66 different coping strategies. Individual scale scores are derived from specific items that are summed and divided by a total score to provide a relative score. These relative scores describe the proportion of effort represented for each type of coping and are expressed as a percentage that ranges from 0 to 100. A high relative score on a scale means that the person used those coping behaviors more often than they used other behaviors. Relative scores are generally preferable because they control for response bias.

The subscales of WCQ are described below:

Confrontative coping: describes aggressive efforts to alter the situation and suggests some degree of hostility and risk-taking.

Distancing: describes cognitive efforts to detach oneself and to minimize the significance of the situation.

Self-controlling: describes efforts to regulate one's feelings and actions.

Seeking social support: describes efforts to seek informational support, tangible support, and emotional support.

Accepting responsibility: acknowledges one's own role in the problem with a concomitant theme of trying to put things right.

Escape-avoidance: describes wishful thinking and behavioral efforts to escape or avoid the problem. Items on this scale contrast with those on the distancing scale, which suggest detachment.

Planful problem solving: describes deliberate problem\focused efforts to alter the situation, coupled with an analytic approach to solving the problem.

Positive reappraisal: describes efforts to create positive meaning by focusing on personal growth. It also has a religious dimension.

2.3.4 Symptoms

The PANSS is a 30-item scale developed to assess symptom severity in schizophrenia (Kay et al., 1988). The PANSS was designed to include three subscales for different types of symptoms: positive symptoms, negative symptoms and general psychopathology. However, studies assessing the dimensions measured by the PANSS have identified five

factors: positive, negative, excitement, cognitive and depression symptoms (Lindenmayer et al., 1994). These five factors were used in the present study. Higher scores indicate higher symptoms severity and impairment.

2.4 Translation

Using standard English-Chinese and Chinese-English dictionaries, I translated the WCQ into Chinese. In order to verify the fidelity of the translated questionnaire, a Singaporean with bilingual skills then independently translated the Chinese language version back into English and the results were compared to the original English version until consistency between the translation and the original version was reached. Patients could choose between English and Chinese version of the questionnaire.

2.5 Procedure

2.5.1 Clinical assessment

Potential subjects were first evaluated and discussed in a clinical interview by two experienced psychiatrists who completed comprehensive screening included a detailed medical history, physical examination, neurological examination and psychiatric interviews. Those patients who met the criteria were invited to participate in the study.

2.5.2 Research assessment

Interview of patients: These patients were interviewed by me with the SCID and completed WCQ. Then I assessed the patients using SUMD, SDS and PANSS. The interviews typically lasted one hour.

Interview of informant: When assessing PANSS and SDS, there was also a possibility that patients' answer would be unreliable (especially about social withdrawal). Thus, if necessary, patients' relatives were interviewed separately as informants with patients' permission.

2.6 Interview skill

The interview was conducted in a quiet setting, the patient and the researcher sat face to face. The researcher remained relatively immobile, avoiding irrelevant movement which had been noted previously to have a distracting effect on the patient. The patient was allowed as much time as he wished to express himself, and the researcher's verbal output was kept at a minimum.

2.7 Data analyses

A principal factor analysis with equamax rotation was conducted with the 30 PANSS items since it is probably most reliable when the number of variables is between 20 and 50 (Hair et al., 1988). The components whose engenvalue were more than two were retained in the model. In each component, items with communality greater than 0.50 were

retained and allocated to factors and items with communality less than 0.50 were excluded from the analysis. Cronbach's alpha was calculated to determine the internal consistence of each component.

Two-tails t test was used to compare the symptoms, insight and coping strategies between deficit and nondeficit groups, and Pearson's Correlations were used to assess the association among the PANSS components, SUMDA items and coping strategies.

All quantitative data analyses were performed using the statistical package SPSS-PC (Norusis, 1999).

Chapter 3 Results

The patient interviews and their self-reported questionnaire formed the main part of data collection in this study. These data were analyzed as follows: 1) demographic data; 2) factor analysis of PANSS scale; 3) comparison between deficit and nondeficit patients group; 4) correlation among demography, symptom, insight and coping strategies.

3.1 Demographic data

One hundred and three DSM-IV schizophrenic patients were studied. All patients were Chinese. 53 (51.5%) were male, 50 (48.5%) were female. The mean age for all cases was 30.5 years (SD±7.72), median age was 30 years, and age range of the sample was 19-55 years. Their marital statuses were: 64 (62.1%) were single, 38 (36.9%) were married, 1 (1%) was widowed. Their education levels were: 9 (8.7%) completed primary school; 34 (33.0%) completed secondary school; 5 (4.9%) completed junior college; 29 (28.2%) completed diploma; 19 (18.4%) completed university; 3 (2.9%) completed postgraduate degree, 4 (3.9%) completed other vocational training. The mean education years for all patients were 12.5 years (SD±2.58). As regards occupations: 44 (43.4%) were employed; 12 (11.4%) were students; 47 (45.4%) were housewives or unemployed. The mean duration of illness for all cases was 4.3 years (SD±2.7).

In addition, according the criteria of SDS, 34 (33.0%) patients were deficit syndrome and 69 (67.0%) patients were nondeficit syndrome. The demographic data between these two groups were not significantly different (see Table 4.1).

Table 3.1 Sociodemographic Characteristics (n=103)

Demography	Deficit syndrome N (%) or mean±SD	Nondeficit syndrome N (%) or mean±SD
Sex: Male	19 (55.9%)	34 (49.3%)
Female	15 (44.1%)	35 (50.7%)
Age, mean±SD	30.0±6.31	30.7±8.36
Marital status: Single	24 (68.6%)	40 (58.8%)
Married	10 (28.6%)	28 (41.2%)
Widowed	1 (2.8%)	
Education years	12.2±2.37	12.7±2.68
Duration, years	4.4±2.24	4.2±2.97
CGI	4.00±1.155	3.81±1.33

Demographic and clinical characteristics description was done with frequencies and percentages for categorical variables and with means and standard deviations for continuous variables.

Table 3.2 Factor loadings of PANSS items in the five-factor model—Equamax

Items	Negative	Disorganized	Excited	Positive	Depressive
Passive/apathetic social withdrawal	0.789				
Motor retardation	0.778				
Disturbance of volition	0.774				
Lack of flow of conversation	0.767				
Blunted affect	0.735				
Emotional withdrawal	0.727				
Active social avoidance	0.577				
Conceptual disorganization		0.803			
Difficulty in abstract thinking		0.765			
Preoccupation		0.762			
Poor attention		0.690			
Mannerisms and posturing		0.628			
Disorientation		0.561			
Stereotyped thinking		0.559			
Hostility			0.850		
Poor impulse control			0.825		
Uncooperativeness			0.735		
Excitement			0.719		
Delusions				0.882	
Suspiciousness/ persecution				0.842	
Hallucinatory behavior				0.617	
Unusual thought Content				0.556	
Grandiosity				0.531	
Anxiety					0.745
Depression					0.687
Tension					0.591
Guilt feeling					0.555
Eigenvalues	5.9	4.3	2.6	2.4	2.1
Variances(%)	19.7	14.5	8.7	8.2	6.9
Cronbach's	0.87	0.83	0.85	0.80	0.67

Footnote: factor loadings less than 0.4 were omitted for clarity

3.2 Factor Analysis of PANSS

The mean PANSS scores of the sample were as follows: PANSS positive subscale 12.83±4.69 (7–31 score range), PANSS negative subscale 17.92±4.87 (9–30 score range), PANSS general psychopathology 29.89±7.06 (16–49 score range), and total PANSS 60.64±13.34 (33–109 score range).

A typical five-factor model of PANSS was revealed after factor analysis. The results of the rotated principal component matrix with the factor loadings for the analysis for the five factors are shown in Table 4.2. Descriptive names were assigned to each factor. The items of poor rapport (N3), somatic concern (G1) and lack of judgment and insight (G12) were not related to a particular factor and therefore excluded. The five-factor principal-component analysis explained 57.9% of the total variance.

3.3 Comparison between deficit and nondeficit syndrome

Table 4.3 shows the mean PANSS, WCQ and SUMDA scores of deficit and nondeficit groups. Differences between the deficit and nondeficit groups were tested independently using two-tailed t test.

As can be seen in table 4.3, relative to those in nondeficit group, patients in deficit group had more negative symptoms ($p<0.01$) in PANSS components. But in other four components there were no significant difference between two groups. Patients with deficit syndrome had poor insight in awareness of mental disorder ($p<0.01$), awareness of the consequences of mental disorder ($p=0.05$), awareness of thought disorder ($p<0.05$)

and awareness of anhedonia ($p<0.01$). Meanwhile, relative to nondeficit group patients, deficit group patients were inclined to adopt more escape-avoidance ($p<0.05$) and positive reappraisal ($p<0.05$) in stress-coping, but less seeking social support ($p<0.01$). So we rejected the null hypotheses, which means: there were some significant difference between deficit and nondeficit group in insight dimensions and WCQ subscale.

Table 3.3 comparison between deficit and nondeficit syndrome

	Deficit syndrome	**Nondeficit syndrome**	**Signifiance.**
PANSS scores			
Positive symptoms	9.76±4.03	10.57±4.88	
Negative symptoms	23.35±4.04	15.91±4.63	p<0.01
Disorganized symptoms	13.62±6.44	12.12 ±4.07	
Depressive symptoms	6.15±2,24	6.88±2.72	
Excited symptoms	5.41±2.20	6.19±3.06	
Coping strategies			
Confrontive coping	0.12±0.04	0.12±0.04	
Distancing	0.13±0.05	0.12±0.04	
Self-controlling	0.12±0.04	0.11±0.04	
Seeking social support	0.12±0.03	0.15±0.04	p<0.01
Accepting responsibility	0.12±0.04	0.12±0.04	
Escape-avoidance	0.14±0.04	0.12±0.04	p<0.05
Planful problem solving	0.12±0.03	0.13±0.04	
Positive reappraisal	0.14±0.03	0.12±0.03	p<0.05
Insight			
awareness of mental disorder	2.29±0.63	1.88±0.76	p<0.01
awareness of the consequences of mental disorder	2.18±0.72	1.88±0.70	p=0.05
awareness of the			

effects of medication	2.00±0.78	1.80±0.76	
awareness of hallucination	1.91±0.87	1.80±0.78	
awareness of delusion	2.15±0.93	2.22±0.92	
awareness of thought disorder	2.32±0.81	1.94±0.86	p<0.05
awareness of flat or blunt affect	2.38±0.65	2.12±0.70	
awareness of anhedonia	2.62±0.55	2.04±0.79	p<0.01
awareness of asociality	2.21±0.64	1.96±0.72	

3.4 Correlation among symptoms, coping strategies and insight

Pearson's correlations were calculated between each scale/subscale of the SUMDA, PANSS, WCQ and demography. Only variables showing a significant association ($p<0.05$) were marked in the tables below.

3.4.1 The relationship between symptoms and insight

There were significant positive relationship between positive symptoms, negative symptoms, general psychological symptoms sum scores and insight dimensions. However, when we checked the relationships between symptoms component of PANSS after five-factor analysis and insight dimensions, we found disorganized component (i.e. cognitive symptoms) was correlated with all insight dimensions, and positive and negative symptoms were correlated with some different insight dimensions. Especially,

awareness of mental disorder was not correlated with positive or negative symptoms. (See table 4.4.1)

In addition, excited component was correlated with awareness of the effects of medicine, awareness of delusions and awareness of thought disorder. We did not find the relationship between insight and depressive component.

Table 3.4.1 The relationship between SUMDA and PANSS (after factor analysis)

Awareness of	Positive	Negative	Disorganized	Excited	Depressive
Mental disorder			0.301**		
Consequences of mental disorder	0.234*	0.230*	0.289**		
The effects of medication	0.302**	0.233*	0.344**	0.258**	
Hallucination	0.314**		0.342**		
Delusion	0.303*		0.262**	0.247*	
Thought disorder	0.221*		0.369**	0.234*	
Flat or blunt affect	0.257**	0.214*	0.316**		
Anhedonia	0.215*	0.393**	0.294**		
Asociality		0.311**	0.229*		

(* p<0.05 ** p<0.01)

3.4.2 The relationship between insight and coping strategies

Table 4.4.2 shows the relationship between insight dimensions and diversity coping strategies. Positive reappraisal and escape-avoidance had positive correlation with some poor insight dimension, and seeking social support and planful problem solving had negative correlation with some other dimensions. The details are below:

Awareness of mental disorder was correlated with positive reappraisal ($p<0.01$) and seeking social support ($p<0.05$).

Awareness of the consequences of mental disorder was correlated with seeking social support ($p<0.01$), planful problem solving ($p<0.01$) and escape-avoidance ($p<0.05$).

Awareness of thought disorder was correlated with seeking social support ($p<0.05$).

Awareness of flat or blunted affect was correlative with seeking social support ($p<0.01$), escape-avoidance ($p<0.05$) and positive reappraisal ($p<0.05$).

Awareness of anhedonia was correlated with escape-avoidance ($p<0.01$) and seeking social support ($p<0.05$).

Awareness of asociality was correlated with seeking social support ($p<0.01$).

There were no other relationship between insight and coping strategies found.

Table 3.4.2 The relationship between insight and coping strategies

SUMDA	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Confrontive coping									
Distancing									
Self-controlling									
Seeking social support	-0.216*	-0.258*				-0.246*	-0.303**	-0.248*	-0.266**
Accepting responsibility									
Escape-avoidance		0.210 *					0.244*	0.255**	
Planful problem solving		-0.215**							
Positive reappraisal	0.256**							0.200*	

(* p<0.05 ** p<0.01)

3.4.3 The relationship between symptoms and coping strategies

Table 4.4.3 shows the relationship between symptoms and coping strategies. There were only negative and depressive component correlated with some coping strategies. As shown in table 4.4.3: the negative component was correlated with escape-avoidance ($p<0.01$) and seeking social supports ($p<0.05$), and depressive component was correlated with distancing.

Table 3.4.3 The relationship between symptoms and coping strategies

	Positive	negative	disorganized	excited	depressive
Confrontative coping					
Distancing					-0.204*
Self-controlling					
Seeking social support		-0.240*			
Accepting responsibility					
Escape-avoidance		0.328**			
Planning, problem solving					
Positive reappraisal					

(* p<0.05 ** P<0.01)

3.4.4 The relationship between insight and demography

The education years were significantly positively correlated with awareness of consequence of mental disorder ($p<0.05$), awareness of the effect of medicine ($p<0.05$)

and awareness of anhedonia ($p<0.01$).In addition, patients who were married had better insight on awareness of consequence of mental disease than patients who were single ($p<0.05$).Especially, clinical global impressions (CGI) had significant correlation with awareness of consequence ($p<0.1$), awareness of the effect of medicine ($p<0.01$), awareness of positive symptoms ($p<0.5$) and awareness of negative symptoms (blunted affect and anhedonia) ($p<0.01$).

Chapter 4 Discussion

In this chapter, we discussed followed questions: 1) factor analysis and the five-factor structure of the PANSS; 2) the relationships among PANSS components, insight dimensions and coping strategies; 3) comparison between deficit and non deficit syndrome; 4) summary of all results; 5) critique of the study.

4.1 The five-factor structure of the PANSS

Our results support a pentagonal model underlying the multidimensional schizophrenic symptomatology assessed by the PANSS, which explained 57.9% of the variance. The factors identified in our study are essentially the same as those described in other studies: Negative, excited, positive, depressive and cognitive.

The negative component contained seven symptoms of the originally included symptoms, four of which were extracted from the original negative subscale and three of the general psychopathology subscale of the PANSS. It appears to be prominent in its contribution to the total presentation (19.7%). Its high internal consistency suggests than the negative component comprises a homogeneous syndrome.

The disorganized factor was second in order of relative importance. It contained seven symptoms, which included in the domain reflect formal thought disorder, as evidenced by the expression of lack of spontaneity, stereotyped thinking, conceptual disorganization and difficulty in abstract thinking. Its internal consistency was high. It is important to consider that the cognitive dimension constitutes one of the fundamental aspects of

schizophrenia, which is in line with previous studies (Andreasen et al., 1995; Bilder et al., 1985; Miller et al., 1993 and Peralta et al., 1992).

The excited component was third in order of relative importance. It contained four items which were extracted from positive and general psychopathology subscale of PANSS. Its internal consistency was high. This factor reflects a behavioral disturbance dimension as evidenced by the particular items of poor impulse control and hostility.

The positive component was fourth in order of relative importance. Despite its modest contribution to total variance, its internal consistency was high. It contained the items of delusions, hallucinatory behavior, grandiosity and suspiciousness assigned previously in the positive subscale and unusual thought content from the general psychopathology subscale of the PANSS. The items of this component essentially correspond to the items more frequently described and clearly reflect pathology of the content of thought and perception rather than overt behavioral manifestations (Lindenmayer et al., 1995).

Depression and anxiety symptoms were loaded in a single factor as well as in the majority of studies (Emsley et al., 2003). This factor does not overlap with negative symptoms, which points to the independence of negative symptoms assessment (Siris, 1995). Depressive symptoms are common in schizophrenia and are usually associated with anxiety (Emsley et al., 1999 and Koreen et al., 1993). As reported previously, there are many explanations for the presence of these symptoms in schizophrenia such as adverse life events, substance abuse or comorbid major depression or anxiety disorders (Emsley et al., 2001a and Emsley et al., 2001b) Nevertheless, depression has been considered as a risk factor for relapses, non-adherence to antipsychotic medication and global psychosocial impairment in schizophrenia (Apiquian et al., 2001). In this study,

the depressive component was fifth in order of relative importance with moderate internal consistency. It contained depression, anxiety, guilt feeling and tension.

The PANSS subscale “lack of judgment and insight” was not contained in the five components. It suggested that lack of insight might be an independent dimension in schizophrenia patients (Peralta and Cuesta, 2001).

4.2 The relationships among PANSS components, insight dimensions and coping strategies

We examined demographic correlates of insight and revealed no significant effect of age and sex. Two previous studies (Amador et al., 1993; David et al., 1992) reported the same results. Educational years were significantly positively correlated with awareness of consequence of mental disorder and awareness of the effect of medicine, which is supported by David et al. (1992) who noted that lack of insight was significantly associated with lower intelligence and highly correlated with education. The finding that schizophrenic patients with low IQ had less insight was replicated in two latter studies (Young et al., 1993; Lysaker and Bell, 1994). In addition, we also found that married patients had better insight than single patients. It suggested that schizophrenic patients with good insight might easily keep marital relationship with partner or conversely, good marital state might be an advantage factor for patients to be aware of their poorer life quality.

4.2.1 The relationship between insight and symptoms in schizophrenia

Poor insight is a common feature of schizophrenia and has a complex relationship to other symptoms of the illness. Before factor analysis, we found that SUMDA dimensions were all significantly correlated with positive and negative sum scores. Especially, they were high correlated with total general psychopathology scores and total PANSS scores, and most of them were correlated with Clinical Global Impressions (CGI). This result agrees with previous studies (Minz et al 2003) and suggested that patients' insight become poorer as they increase in severity.

However, after factor analysis, we found positive and negative component were not significantly correlated with awareness of mental disorder. Instead, cognitive component become the best predictor of insight dimensions. Awareness of illness, awareness of consequence and treatment compliance were all highly significantly correlated with cognitive component ($p<0.01$), while unawareness of consequence and treatment compliance were also significantly correlated with positive and negative components.

We suspected that the correlation between insight and cognitive component reflects the relationship between insight and cognitive functions. Many researchers have reported the relationship between symptoms and cognitive function in schizophrenic patients. In general, positive symptom is related to frontal executive tasks such as WCST and Trails B, and negative symptom is related to mental tracking tasks that require motoric and dexterous manipulation such as the grooved pegboard and the WAIS-R Digit symbol task (Zakzanis KK, 1998). Norman et al (1997) manifested that reality distortion is related to left temporal lobe function (RAVLT and WMS-LM). However, these studies all based on simple dichotomous model and the disorganized symptoms were contained in positive and negative symptoms so that the relationships in these studies were not reliable.

A series of studies were framed for the third-dimension model. Liddle and Morris (1991) suggested that psychomotor poverty was found to be associated with slowness of mental activity and disorganized syndrome was associated with impairment in tests in which the subject is required to inhibit an established but inappropriate response. Malla et al (1995) found that dysfunction in movement planning is related primarily to concurrent disorganization, as well as the prominence of disorganization over the patient's history. Cyesta MJ and Peralta V (1995) testified that the disorganization and negative syndrome were more strongly associated with cognitive disturbances than was the positive syndrome, and both were associated with disturbances of visual-motor process. Moreover, the disorganization syndrome was associated with disturbances in language and verbal memory and in time-controlled performance. Williams LM (1996) proposed that the disorganization, reality distortion and episodic subgroup were associated with reduced, indeed reversed, negative priming in unattended priming conditions, whereas the psychomotor poverty subgroup exhibited the usual negative priming effect. In Baxter RD and Liddle PF (1998)'s study, disorganization syndrome was associated with impaired performance in the classic Stroop test, but not with impairments in a task which required the suppression of processing of irrelevant aspect of a stimulus, nor with impairment in a task which required the suppressing of a primed but irrelevant non-verbal response. In patient with persistent illness, psychomotor poverty was associated with slower response in a two-choice guessing task in which the appropriate response was not dictated by the circumstances. This association was not observed in patients with remitting illness. It supported the distinction between negative and defecit symptom. Arango C (2000) revealed that disorganization was significantly related to the total score on the

Neurological Evaluation Scale (NES) to sensory integration and to the sequencing of complex motor acts, whereas the deficit syndrome was significant related to sensory integration only. Lee KH et al (2001) factor analyzed PANSS by both the positive/negative dichotomy and the three-dimension model and found that only the disorganization dimension showed a significant association with increased global smooth pursuit eye movement (SPEM) dysfunction. Bozikas and coworkers (2004) studied the relationship between positive, negative, cognitive, depressive, and excitement symptom dimensions of schizophrenia and cognitive functioning. They revealed that the cognitive symptom dimension correlated with executive functions, attention, verbal memory, and spatial ability. Severity of the negative symptom dimension was related to impairment in the structure of the semantic knowledge system, verbal memory, and auditory attention. In contrast, severity of the positive symptom dimension correlated only with impairment in the structure of the semantic knowledge system, and psychomotor speed. In these cognitive dysfunctions, only the relationship between insight and executive performance were replicated by many different authors (Smith et al. 2000; Rossell et al. 2003; Drake and Lewis 2003). All these research have supported that the disorganization symptom is an independent subgroup in the schizophrenia and have a reasonable basis of neuropsychology. It is reasonable to suppose that patients with worse cognitive function tend to reveal more severe disorganized symptoms and poorer insight.

We also found that there might be different mechanisms between awareness of positive symptoms and awareness of negative symptom though they all correlated with cognitive symptoms. Awareness of positive symptoms correlated with positive and excited component but not correlated with negative component, while awareness of negative

symptoms correlated with negative component. One possible reason of this difference can be because of the definitions of the symptoms. For example: patients with severe delusions must be unaware of their abnormal thought, and similarly, patients with anhedonia seldom feel uncomfortable when they are indifferent to their circumstance. Another interpretation is, as Sevy et al. (2003) showed, unawareness of symptoms is related to severity of illness and severity of symptom represents severity of illness.

Many studies (Minz et al. 2003) revealed a positive relationship between insight and depression, but we did not find that relationship between them because the patients we recruited had less depressive symptoms.

4.2.2 The relationship between insight and coping strategies in schizophrenia

Results of this study are consistent with previous finding that lack of insight in schizophrenia is linked with some negative coping strategies (Lysaker et al. 2001). Awareness of mental disorder has a negative correlation with positive reappraisal while awareness of consequence has a negative correlation with escape-avoidance preference. Both coping strategies were correlated with awareness of blunted affect. Furthermore, planful problem solving has a positive correlation with awareness of consequence too. In addition, we also found that seeking social support significant correlated with many dimension of insight, including awareness of mental disorder, awareness of consequence, awareness of thought disorder and awareness of three negative symptoms.

However, it is possible that different coping strategies affect insight by different mechanisms. Generally, escape-avoidance may represent the unconscious psychological defense such as denying and sealing over, and self-reappraisal may indicate more

cognitive coping in some aspect of self-evaluation. There may be the third mechanism to interpret the relationship between planful problem solving and awareness of consequence of mental disorder, that is, they both reflect the level of cognitive functions. Finally, not seeking social support can be in relation to some special personality traits

There are not only one mechanism which can interpret the relationship between insight and special coping strategies. For example, all the following interpretations for the relationship between insight and seeking social support are reasonable: first, patients who prefer to adopt seeking social support were more aware of their own mental disorder because they can get more feedback from other people. Second, lack of insight hinders patients from communicating with others so that patients gradually withdraw from society. Third, both lack of insight and not seeking social support may be the results of cognitive dysfunction in schizophrenia. We suppose that these three mechanisms may contribute to the relationship together.

From the relationship between insight and coping strategies we also conclude that social withdrawal and self appraisal are important reasons for poor insight. Thus, it suggested that psychotherapies could be beneficial to improve patients' insight, such as cognitive and behavior therapy. Recent studies have shown cognitive behavioural therapy (CBT) to be of benefit in the treatment of positive symptoms (Tarrier et al., 1998) and negative symptoms (Sensky et al., 2000) of schizophrenia. Compliance has been cost-effectively (Knapp and Healey, 1998) improved by a brief CBT intervention in patients with schizophrenia (Kemp et al., 1996). The insight study (Turkington et al., 2002) reported a statistically significant improvement in overall insight and symptoms of depression at

post-therapy assessment with a brief insight-oriented CBT intervention delivered by trained nurses to patients with schizophrenia in the community.

Since different psychosocial mechanisms contribute to insight and treatment compliance, we suspect that not only CBT but other format of psychotherapy such as group and family therapy can be beneficial to improve insight.

4.2.3 The relationship between symptoms and coping strategies in schizophrenia

In schizophrenia, there is evidence that premorbid personality features correlates with the symptoms. In a prospective follow-up cohort, positive symptoms associated with overactive, irritable, distractible and aggressive behaviour at school (Cannon et al 1990). In a cross-sectional study with recent onset patients, disorganized symptoms were found to be associated with antisocial behaviour (Cuesta et al 1999). Especially, negative symptoms have been associated with long-standing schizoid traits in cross-sectional (Cuesta et al 1999; 1991) and prospective studies (Jorgensen and Parnas, 1990) and with poor psychosexual development in first-episode patients (Salokangas, 1999). However, we were not able to determine the relationship of personality traits to positive or disorganized symptoms because WCQ questionnaire cannot be taken to reflect antisocial or aggressive behaviours. The mere results corresponding previous research are negative symptoms were associated with escape-avoidance ($p<0.01$) and less seeking social support ($p<0.05$), and depressive symptoms were correlated with distancing ($p<0.05$).

4.3 Comparison between deficit and non deficit syndrome

It is not surprising that patients in the deficit group had more negative symptoms because the deficit syndrome is defined according to primary negative symptoms. However, as previously reported (Kirkpatrick et al., 2001), deficit schizophrenia should be associated with less depression compared with nondeficit schizophrenia, and we also expected that deficit schizophrenia have less excited symptoms. In fact, both depressive and excited symptoms in deficit and nondeficit group were not different. The probable reason is the majority of patients we collected were mild and not with excited and depressive symptoms.

Our study supports the previous findings (Amador XF, David AS, 1998) that insight of deficit schizophrenic patients was poorer than that of nondeficit ones. The four poorer insight dimensions in deficit syndrome was awareness of mental disorder, awareness of the consequences of mental disorder, awareness of thought and awareness of anhedonia. It is obvious that the insight difference between deficit and nondeficit schizophrenia can only be interpreted by primary symptoms difference because other symptoms and demography in these two groups were not different.

Especially, we attended that primary negative symptoms had significant relationship with awareness of mental disorder even though there was no significant correlation between awareness of mental disorder and PANSS negative components. It supposes that neither PANSS negative sum-score nor negative component after factor analysis can reflex the severity of primary negative symptoms.

Furthermore, the most important finding in the comparison is the difference of coping strategies between deficit and nondeficit syndromes. According this difference, patients with deficit schizophrenia were inclined to use negative coping strategies such as escape-

avoidance or positive reappraisal, but seldom seek social support. It is corresponded with our hypotheses and supported by previous studies about course of deficit syndrome. In those studies we know that patients with deficit schizophrenia have poorer function than patients with nondeficit schizophrenia before the appearance of positive psychotic symptoms. In the Chestnut Lodge study, patients with deficit schizophrenia were less likely to marry before their first hospitalization than were patients with nondeficit schizophrenia, a difference that was not confounded by age of onset; more frequently had an insidious onset; and more frequently exhibited dyskinetic movements before drug treatment (Fenton et al. 1992; 1994). During early and middle adulthood, patients with deficit schizophrenia continue to exhibit poorer social and occupational function than do other patients with chronic schizophrenia (Fenton et al 1994; Kirkpatrick et al 1996), and in light of the evidence above, this difference cannot be attributed to more severe psychotic symptoms or substance abuse in the deficit group. All these finding suggests that deficit syndrome can be related to some special personality traits.

The strong association of long-standing negative coping strategies with deficit syndrome raises a question of their possible causal relationship. Since our study was cross-sectional, we cannot make direct inferences about the direction of effect. Two possible explanations for our results are discussed here: 1) coping strategies modify symptoms, possibly by affecting adaptive mechanisms; 2) an evolving subclinical disorder is manifested as certain dysfunctional personality characteristics (a premorbid state).

Regarding deficit syndrome, there is a lot of evidence for the second hypothesis. For example, Peralta et al. (1991) concluded that negative symptoms in schizophrenia might, in some cases, be merely a continuation or exacerbation of premorbid schizotypal traits.

They called this “the continuity model”. Others have also come to a similar conclusion (Cuesta et al 1999; Vollema et al 1995). Several of the WCQ subscales that were associated with negative symptoms show, in their more disturbed forms, phenomenological resemblance to various aspects of schizotypal trait. In the WCQ, intimacy and reciprocity are described as “I talked to someone to find out more about the situation” or “I general avoided being with people”, which belonged to seeking social support or escape-avoidance subscale. In spite of their inferred psychodynamic content, these subscales are likely to correlate with schizotypal anhedonia, withdrawal, introversion and social anxiety. Thus, it may be that our finding partly illustrates the same “continuity” of schizotypal traits that has been demonstrated in other studies. However, premorbid schizotypal traits are, in fact, not very common in schizophrenia (Weiser et al 2001). It would be likely that they only account for our finding in deficit syndrome. Therefore, we hypothesize that schizotypal traits could be more frequently detected as premorbid symptoms in deficit syndrome. It need some cohort study to testify the hypothesis.

4.4 Summary of all the results

The most significant findings from this study concern the relationships between poor insight, negative coping strategies and deficit syndrome in chronic schizophrenic patients. Demographic and other clinical characteristics account little for the differences between deficit and non deficit syndromes. The view that deficit schizophrenia represents the severe end of a single schizophrenia continuum is not compatible with our finding.

Kirkpatrick et al (2001) declared that deficit syndrome was a separate disease with the syndrome of schizophrenia. Our results support their studies.

However, from the difference in insight between deficit and nondeficit schizophrenic patients, we find that the mechanisms of lack of insight are quite complex. On the one hand, we know that the negative coping strategies such as escape-avoidance, self-reappraisal and less seeking social support contribute to different insight; on the other hand, there are also different cognitive functions between two groups. Still, our finding cannot determine whether there exist relationships between cognitive function and coping strategies because we did not collect the data on cognitive function. However, other researchers had provided evidence that comparing with nondeficit patients, deficit patients not only have the anterior cingulate basal ganglia-thalamocortical circuit (AC) behavioral and functional abnormalities (i.e. positive psychotic symptoms and abnormal function in that neural substrate), but also the dysfunction of the dorsolatera prefrontal basal ganglia-thalamocortical circuit (DLPFC). That means the deficit group was significantly more impaired than the nondeficit group on measures sensitive to frontal and parietal lobe dysfunction. We suspect that poor parietal lobe cognitive function might also be the reason of poor insight and negative coping. A further study should be needed.

4.5 Limitation of this study

There are some methodological limitations to this study. Firstly, the relatively small sample size and the Chinese ethnic characteristics of the patients may limit generalizability of the finding, such as to other ethnic groups. Secondly, we only

recruited patients who were cooperative enough to complete interview and WCQ questionnaire so that extremely severe cases had no possibility to be included in our sample. Most of the patients who were recruited for study sought treatment in outpatient clinics, and usually had less symptoms and better insight. There may therefore be some sample bias. Thirdly, both insight and symptoms were evaluated by the same rater, which may have caused observer bias. A self-reported insight scale might have avoided this bias. The most important limitation of this study is that cognitive functional tests are not included in the data collection. This limitation and design of retrospective study are such that it is impossible to find the causal relationship between insight, coping strategies and cognitive function.

There are several questions that were not resolved by this study: Is deficit syndrome a kind of schizophrenia based on specific personality? Are changes of coping strategies causes or results of primary negative symptom? Which reason decides the difference of insight between deficit and nondeficit syndrome, cognitive dysfunction or personal traits? Further studies are needed.

Chapter 5 Conclusion

This paper reported on the findings of a retrospective study in which 103 chronic schizophrenic patients were interviewed using a semi-structured interview schedule and a self-report questionnaire (WCQ). The study yielded a rich amount of data of phenomena of insight, coping strategies and symptoms. We found that deficit syndrome was related to negative coping strategies and poor insight, supporting the view that deficit syndrome is a separate disease within schizophrenia. We also replicated the relationship between insight, PANSS scales and coping strategies. This recognition of insight in schizophrenia could be helpful in developing psychotherapy skills to enhance treatment adherence of the patients.

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